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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,987	07/11/2003	Manuel J. Tavares	IR-3225(EA)CIP	4251

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LORD CORPORATION
PATENT & LEGAL SERVICES
111 LORD DRIVE
CARY, NC 27512

EXAMINER	
WU, IVES J	
ART UNIT	**PAPER NUMBER**
1713	

DATE MAILED: 11/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/617,987	TAVARES ET AL.	
	Examiner	Art Unit	
	Ives Wu	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

(1). This Office Action is in response to the applicant's Remarks and Amendments filed on September 19, 2005 for application serial no: 10/617987.

The objection of the specification in the prior Office Action dated June 20, 2005 is withdrawn in accordance with the Amendments.

Applicants amend claims 2-4. However, it is noticed that claim 1 is also amended to use "anhydride adduct of polybutadiene polyol" instead of "anhydride adduct of polybutadiene" of the original claim 1. Thereby, applicant's confirmation and correction is required.

Claims 6 – 20 are newly added.

In view of the applicant's amendments and remarks, the rejection for original claims 1-4 in prior Office Action dated June 20, 2005 are modified, the rejection for claim 5 in prior Office Action dated June 20, 2005 is withdrawn and the new ground rejection for claims 1-20 is presented together as following.

Claim Rejections - 35 USC § 103

(2). The text of those sections of Title 35, U.S. Code not included in this action can be found in the prior Office Action dated June 20, 2005.

(3). **Claims 1-4** are rejected under 35 U.S.C. 103(a) as being unpatentable over Song (US005567761A) in view of Harper (US005962586A) and Boeckeler (US005587433A).

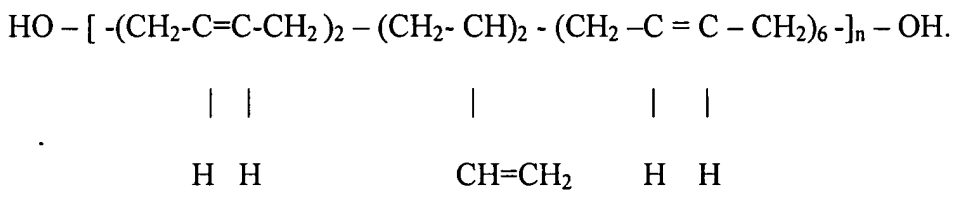
As to part (A) of a two part curable liquid potting composition in **independent claim 1**, Song (US005567761A) discloses an Aqueous two-part isocyanate-free curable polyurethane resin systems and its Aqueous-borne coating compositions containing: (1) an acetoacetylated polymer; and (2) a polyacrylate having at least two (meth) acrylate end groups, have long pot lives and may be cured by the evaporation of water in the presence of a basic catalyst, Abstract, line 1-8; Organic compounds containing at least two hydroxyl groups are reacted with the above organic polyisocyanates to form the single –NCO teminated or hydroxyl-terminated urethane prepolymers. Useful organic compounds containing at least two hydroxyl groups including, not limited to alkyl polyols, ester polyols, ether polyols, acrylic polyols, and thioether polyols (Col. 9, line 33-41). As to the free isocyanate < 1000 ppm in part A is concerned, it can be as little as zero.

Song does not teach using the part (B) as cited in the instant claim 1.

However, Harper teaches using the polybutadiene-maleic anhydride adduct in a liquid curable potting compound, Abstract, line 7, Col. 1, line 17-20; 1,2-Polybutadiene resins having a molecular weight of 1000 to 4000, Col. 5, line 18-19.

Both Song and Harper do not teach the polybutadiene in the anhydride adduct to be hydroxyl terminated polybutadiene polyol having 1.9 – 2 OH group per molecule and number average molecule weight from 1000 – 10,000.

However, Boeckeler teaches a hydroxyl terminated polybutadiene compositions, Col. 1, line 8-9; the hydroxyl terminated polybutadiene has the general formula with 2 OH per molecule:



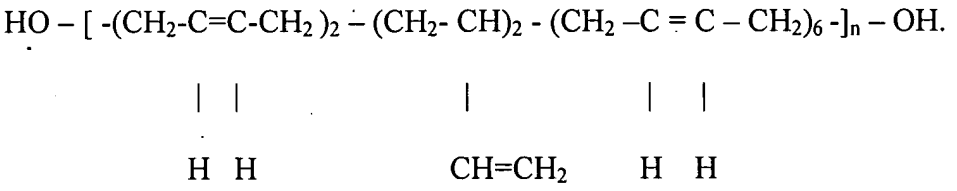
The advantage of using anhydride adduct of polybutadiene is that it contains the hardener or hardeners for the curable liquid potting composition (Col. 2, line 13-14: Harper US005962586A).

The advantage of selecting hydroxyl polybutadiene for the anhydride adduct is because resins prepared with hydroxyl terminated polybutadiene such as anhydride of hydroxyl terminated polybutadiene possess unique and desirable properties. These properties includes low water absorption, low moisture permeability, high hydrolytic stability, high solvent and chemical resistance, excellent low temperature flexibility and good bonding to a variety of substrates (Col. 1, line 14-19: Boeckeler US005587433A); hydroxyl terminated polybutadiene can be reacted rapidly with polyisocyanates to yield tough, elastomeric polymers which have good hydrolytic stability (Col. 1, line 22-26: Boeckeler US005587433A).

Therefore, it would have been obvious at the time of applicant's invention to combine the polybutadiene-maleic anhydride adduct taught by Harper with Song's aqueous two-part isocyanate-free curable polyurethane resin systems to form applicant's liquid curable potting composition because it will achieve the aforementioned advantage by using anhydride adduct of polybutadiene. Furthermore, to choose anhydride adduct of hydroxyl terminated polybutadiene

disclosed by Boeckler for Harper's anhydride adduct of polybutadiene in Song's potting composition would obtain the aforementioned two advantages. Moreover, since both Song and Harper teach a liquid curable composition for potting, a person of ordinary skill in the art would have expected the combination of Song and Harper (that will cover the part (A) and part (B) of instant claim 1) to work in an additive or cumulative manner. *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). Also, the anhydride adduct of polybutadiene taught by Harper is genus, the anhydride adduct of polybutadiene polyol is species, one ordinary skill in the art would expect all species work well for the genus, motivated by a reasonable expectation of success. *In re O'Farrell,* 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988).

As to the limitation of **dependent claim 2 and 3**, Boeckeler teaches a hydroxyl terminated polybutadiene compositions (Col. 1, line 8-9); the hydroxyl terminated polybutadiene has the general formula with 2 OH per molecule:



The preferred hydroxyl terminated polyisocyanate is POLYbd 45 HT available from elf Atochem Co (Col. 2, line 63 – Col. 3 line 8), it is further disclosed to have molecular weight 2800 by Frisch et al (Col. 1, line 49-50, US005672653A).

As to the limitation of **dependent claim 4**, Song disclose the examples of aromatic polyisocyanates including 4,4'-di-isocyanatodiphenyl methane, Col. 9, line 24-26.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(4). **Claims 1-7 and 9-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Earing et al (US004313858) in view of Werner et al (US003660532).

(5). As to part (A), hydroxyl capped polyisocyanate containing < 1000 ppm of free isocyanate in the two part curable liquid potting composition in **independent claim 1**, Earing et al disclose a thermally-stable polyurethane encapsulating resin system comprising a polyurethane prepolymer made by reacting a polyisocyanate with a polyol to form an isocyanate-terminated

prepolymer (Abstract, line 1-4). Generally, these resin materials may be useful, for instance, as liquid castable elastomers as well as potting and encapsulating compositions (Col. 1, line 22-25). Earing et al disclose even a small amount of unreacted polyisocyanate may well to be present, it will not exceed about 20% (Col.3, line 49-55), thereby, the content of free isocyanate, in any event, can be ZERO. It further discloses the use of drying oil (Col.7, line 66 – Col. 8), liquid polybutadiene polyol (Col.6, line 41), and preferred liquid aromatic polyisocyanates (Col. 3, line 9-10) indicating the liquid state of potting composition.

As to part (B), anhydride adduct of polybutadiene polyol comprising polybutadiene segment having molecular weight from 500 to 20,000 in the two part curable liquid potting composition in **independent claim 1**, Earing et al **teach** 2nd part of composition to be polyol maybe same as polyol used to react with polyisocyanate (Col. 4, line 40-42) which is polybutadiene polyol with molecular weight in the range of 400 to 25,000 (Col. 5, line 16-17).

Earing et al **do not teach** the use of anhydride adduct of polybutadiene polyol.

However, Werner et al (US003660532) **teach** a broad disclosure that a diol is reacted with a monomeric unsaturated anhydride to produce a terminally unsaturated adduct having a molecular weight of 2,000 to 20,000. On polymerization of this prepolymer with other vinyl monomer, a castable, vulcanized elastomeric resin is obtained (Abstract). The resins are useful as potting compounds, vibration dampeners, etc (Col. 1, line 24-25). Illustrated In Example 4 for the preparation of polybutadiene diol with maleic anhydride (Col. 5, line 24-33). The unsaturation of the diol adduct must be such that the formed adduct is polymerizable with intended vinyl monomer (Col. 2, line 21-23).

The advantages of using anhydride adduct of polybutadiene diol are (1). Already a potting component. (2). Polymerizable with isocyanate such diisocyanate, in turn, may be further react with hydroxyl or carboxyl group (Col. 2, line 57-61: Werner et al US00366053). Further evidenced that the polyisocyanate may be bifunctional, i.e., a diisocyanate to be reacted with polyol in the composition of Earing et al (Col. 2, line 52-53: Earing et al US004313858). With the same diisocyanates, it proves the capability of combining anhydride adduct of polybutadiene diol with polyisocyanate capped by polybutadiene polyol.

Therefore, it would have been obvious at time the invention was made to use anhydride adduct of polybutadiene diol of Werner et al in place of polybutadiene polol in the potting composition of Earing et al in order to obtain the aforementioned advantages.

(6). As to the limitation of **dependent claim 2**, Werner et al disclose non-hydrogenated polybutadiene diol having two hydroxyl groups per molecule in Example 4 (Col. 5, line 24-25). It is well known that the polyol includes diol, triol etc.

As to the limitation of **dependent claim 3**, Werner et al disclose the M.W of non-hydrogenated polybutadiene diol to be 1,500 and 10,000 in Example 4 (Col. 5, line 24-25, line 64). It is well known that the polyol includes diol, triol, etc.

As to the limitation of **dependent claim 4,** Earing et al disclose suitable polyisocyanates including diphenylmethane 4,4' –diisocyanate (Col. 3, line 3).

(7). As to the limitations of **independent claim 5**, the disclosure of Earing et al and Werner et al is incorporated herein by reference. The most subject matters of polyol capped polyisocyanate

for part (A) and anhydride adduct of a polyol for (B) has been discussed in the applicant's claims 1 and 3 in paragraphs (5) and (6).

As to the limitations of **dependent claim 6,** Earing et al disclose that in any event, a sufficient amount of hydroxyl-terminated diene polymer is present in the resin product (provided in either or both of the polyol reactants used to make the prepolymer or in the curing polyol component) to provide adequate pendant vinyl reactive sites in the intermediate product to result in the desired thermal stability and other advantageous properties of the ultimately cured product resin (Col. 4, line 14-21).

As to the limitations of **dependent claim 7,** Earing et al disclose the polyisocyanates which are useful in preparing the polyurethane prepolymer of the invention are essentially hydrocarbon polyisocyanates, and are preferably the aromatic, aliphatic and alicyclic polyisocyanates (Col. 2, line 55-59).

As to the limitations of **dependent claim 9,** Werner et al disclose these anhydrides including maleic anhydride (Col. 2, line 40-41).

As to the limitations of **dependent claim 10,** Earing et al disclose preferred peroxide promoters are organic peroxides (Col. 7, line 47).

As to the limitations of **dependent claims 11-14**, Earing et al disclose either or both of the polyurethane prepolymer component and the curing polyol component may including a minor amount based on the total system of drying oil (Col. 7, line 66 – Col. 8, line 1). Linseed oil is a particularly advantageous drying oil (Col. 8, line 68 – Col. 9, line 1).

As to the wt percentage of the polyol capped isocyanate in the total composition to be at least 20% in **dependent claim 15**, and 40 to 70% in the **dependent claims 16 and 17**, Earing et

al disclose 45 parts by wt of polyol capped polyisocyanate in Example 1, and 31 parts by weight of polyol capped polyisocyanate in Example 9 (Col. 9 and Col. 11).

As to the polybutadiene segment having molecular weight from 500 to 20,000 in the polyol capped polyisocyanate in the **dependent claims 15-17**, the disclosure of Werner et al is incorporated herein by reference, the most subject matter of Molecular weight of the polybutadiene segment has been recited in the applicant's claim 5 and has been discussed in paragraph (7) for applicant's claim 5.

As to the limitations of **dependent claim 18**, the disclosures of Earing et al and Werner et al are incorporated herein by reference. The most subject matters of anhydrides, accelerator and diluent has been recited in the applicant's claims 9-11, nad has been discussed in paragraph (7) for applicant's claims 9-11.

(8). **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Earing et al (US004313858) in view of Werner et al (US003660532), and further in view of Markusch et al (US006242556B1).

As to limitation of dependent claim 8, Both Earing et al and Werner et al **do not teach** the polyisocyanate to be blend of an MDI adduct having a NCO group content of 15 to 30% and an allophanate-modified MDI having a NCO group content of 12 to 32.5%.

However, Markusch et al **teach** a liquid MDI polyisocyanate compositions having an NCO group content of 15 to 30% and comprising a blend of MDI adduct having an NCO group content of 15 to 30%, and an allophanate-modified MDI having an NCO group content of 12 to 32.5% (Abstract).

The advantage of using this polyisocyanates blend is to improve freeze stability (Abstract, line 2).

Therefore, it would have been obvious at time the invention was made to use the the blend of polyisocyanates disclosed by Markusch et al for the polyisocyanates components in the composition taught by Earing et al in order to obtain the aforementioned advantage. The polyisocyanates taught by Earing et al is genus, the blend of isocyanates taught by Markusch et al is species, one ordinary skill in the art would expect all species work well for the genus, motivated by a reasonable expectation of success. *In re O'Farrell,* 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988).

(9). **Claims 19 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Earing et al (US004313858) in view of Werner et al (US003660532), and futher in view of "Suprasec" product range from website: www.huntsman.com/pu/ace.

As to the limitation of **dependent claim 19**, both Earing et al and Werner et al **do not teach** the polyisocyanate to be uretonimine modified MDI.

However, it is well known in the art that the advantages of using uretonimine modified pure MDI will improve stability at the low temperature, wetting and lower viscosity as a component in the composition (page 3, Suprasec product range).

Therefore, it would have been obvious at time the invention was made to choose uretonimine modified MDI as polyisocyanate component to be capped by polyol in the composition of Earing et al in order to obtain the aforementioned advantages.

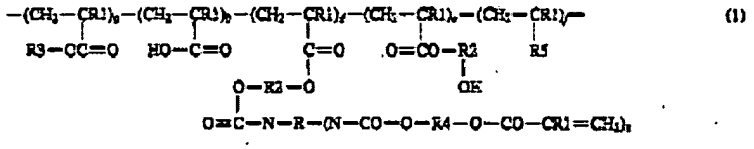
As to limitation of **dependent claim 20**, Earing et al disclose the hydroxyl-terminated, diene polymer with a molecular weight ranged from 400 to 25,000 (Col. 5, line 10-23).

Response to Arguments

(10). Applicant's arguments filed on September 19, 2005 have been fully considered but they are not persuasive.

(11). In regards to the issue of polyol capped polyisocyanate in original claim 1, the limitation of part (A) in original claim 1 only addresses to hydroxyl capped polyisocyanate, besides, Song also discloses the embodiment of using polyol to react with polyisocyanate as cited in paragraph (3) of this Office Action.

(12). In regards to the statements of "Thus, the Song polyacrylate does not include any hydroxyl terminal or pendant groups" cited on page 10 in applicant's Remarks filed on September 19, 2005, Song discloses the general formula (1), typically:



(1)

There are at least two hydroxyl groups in the NCO-free water-dispersible acrylated urethane acrylic (WDAUA) (Col. 12, line 60 – Col. 13, line 30) which is part (B) a polyacrylate in Song's two-part potting composition.

Conclusion

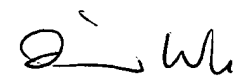
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ives Wu whose telephone number is 571-272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner: Ives Wu
Art Unit: 1713

Date: November 9, 2005



DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700